OIPE JC50 JUN 13 2005 PATENT & TRADEMARK OFFICE

FIG. 1

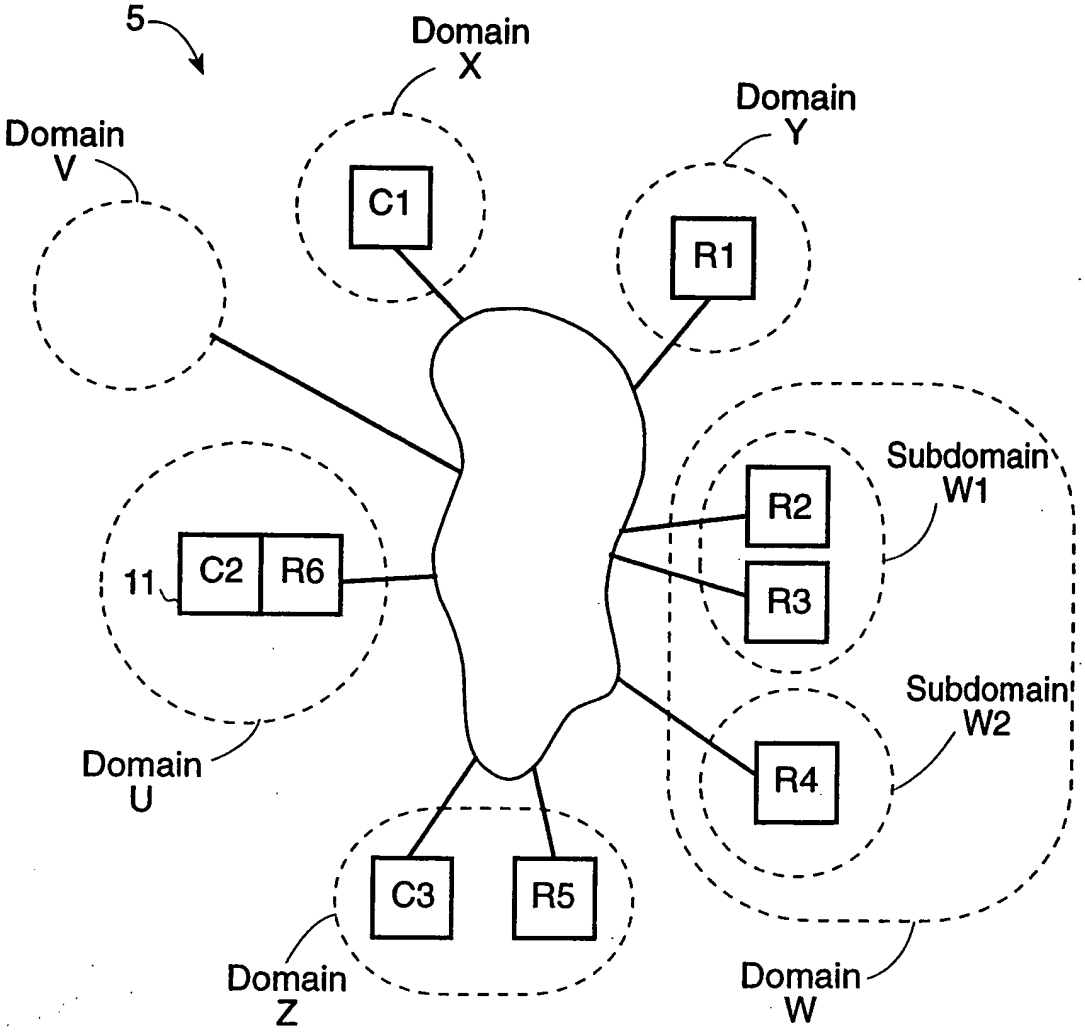


FIG. 2

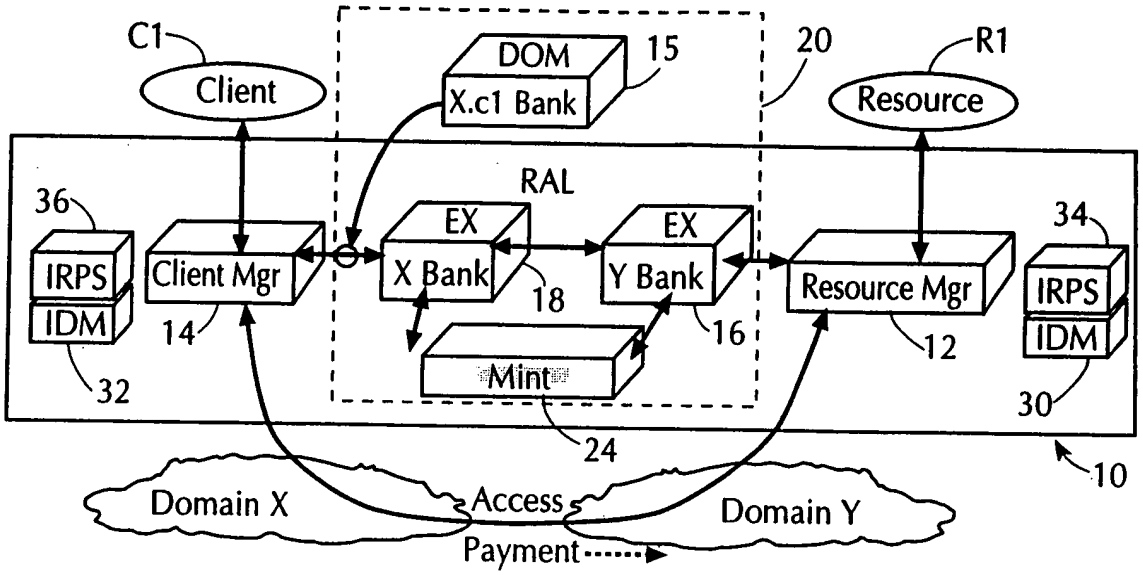

C1
Client
DOM
X.c1 Bank
15
20
R1
Resource
RAL
36
IRPS
IDM
32
Client Mgr
14
EX
X Bank
18
EX
Y Bank
16
Mint
24
Resource Mgr
12
34
IRPS
IDM
30
10
Domain X
Access
Payment
Domain Y

FIG. 3

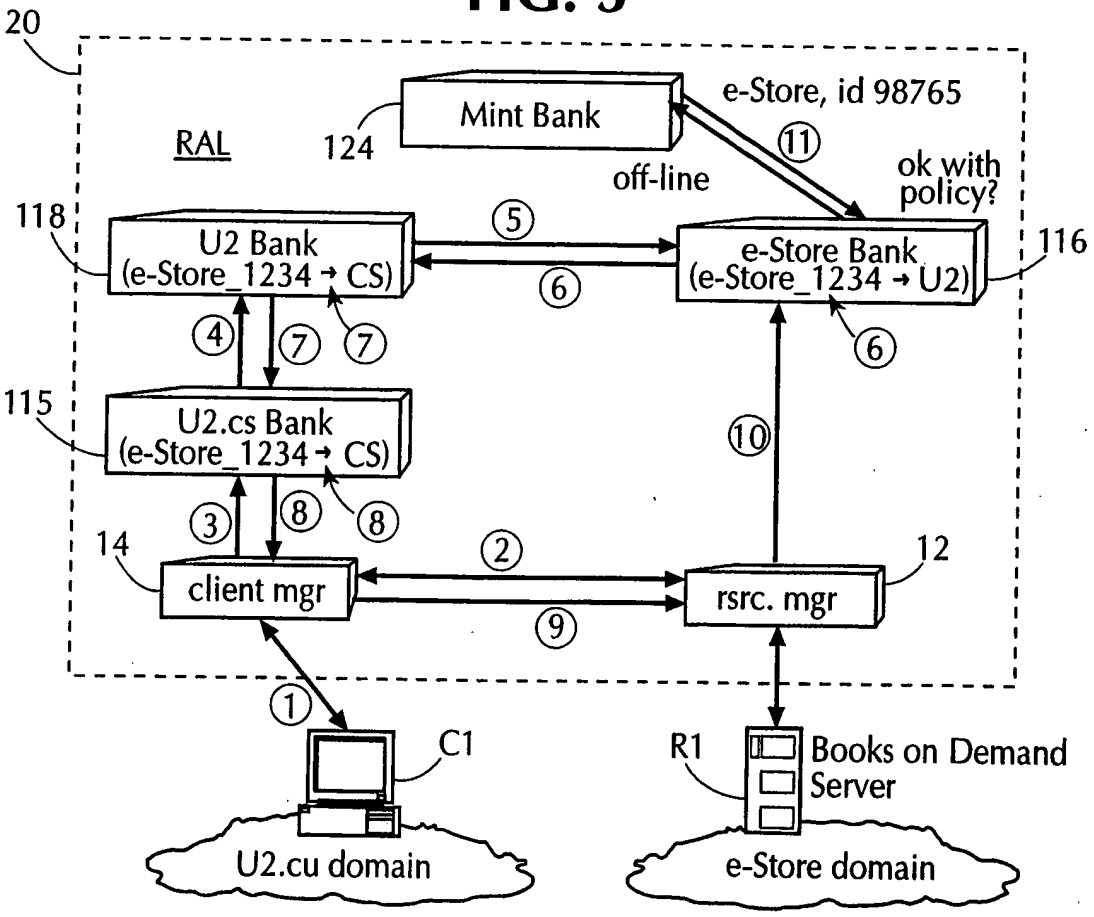

20
RAL
Mint Bank
124
e-Store, id 98765
11
off-line
ok with policy?
118
U2 Bank (e-Store_1234 → CS)
5
6
e-Store Bank (e-Store_1234 → U2)
116
4
7
7
6
115
U2.cs Bank (e-Store_1234 → CS)
10
3
8
8
14
client mgr
2
9
rsrc. mgr
12
1
C1
U2.cu domain
R1
Books on Demand Server
e-Store domain

FIG. 4

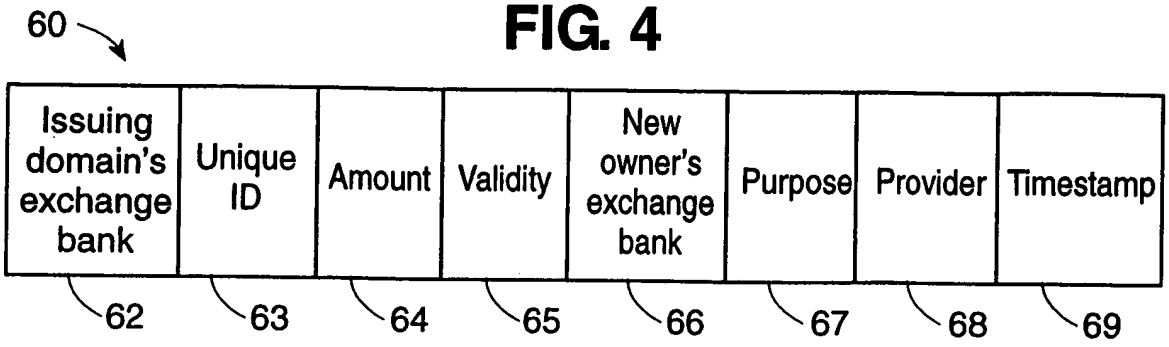

60
Issuing domain's exchange bank
Unique ID
Amount
Validity
New owner's exchange bank
Purpose
Provider
Timestamp
62
63
64
65
66
67
68
69

FIG. 6

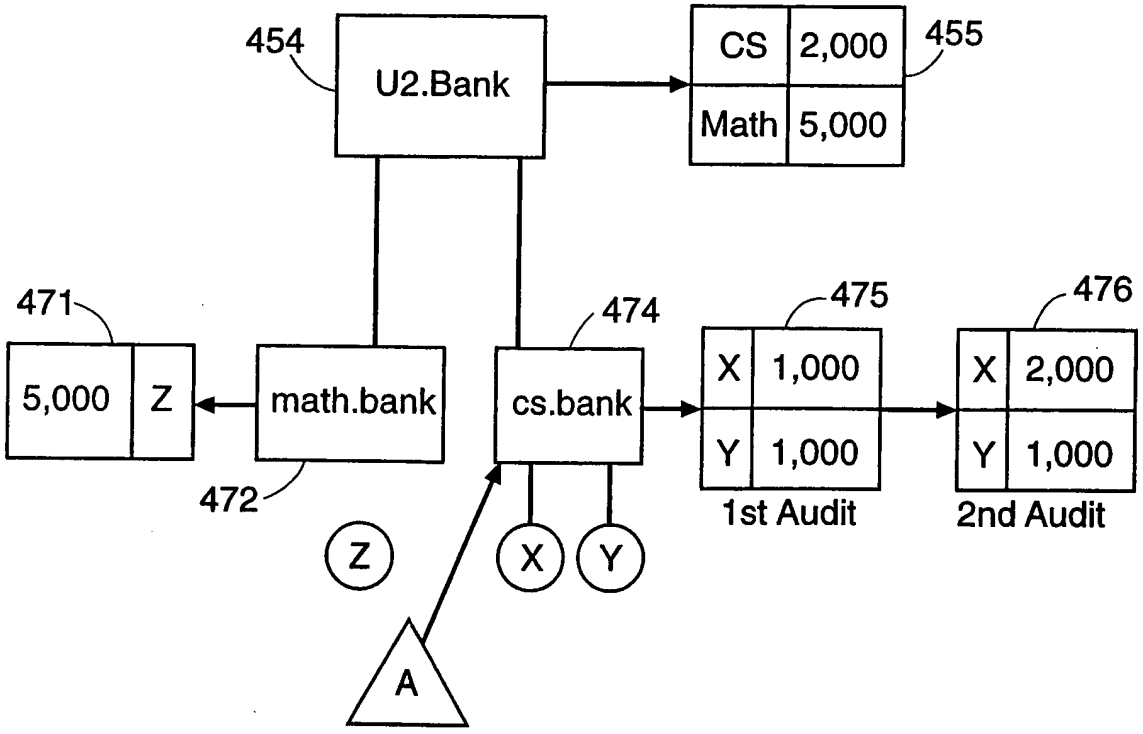

454
U2.Bank
CS 2,000
Math 5,000
455
471
5,000 Z
math.bank
472
474
cs.bank
475
X 1,000
Y 1,000
1st Audit
476
X 2,000
Y 1,000
2nd Audit
Z
X
Y
A

FIG. 5A

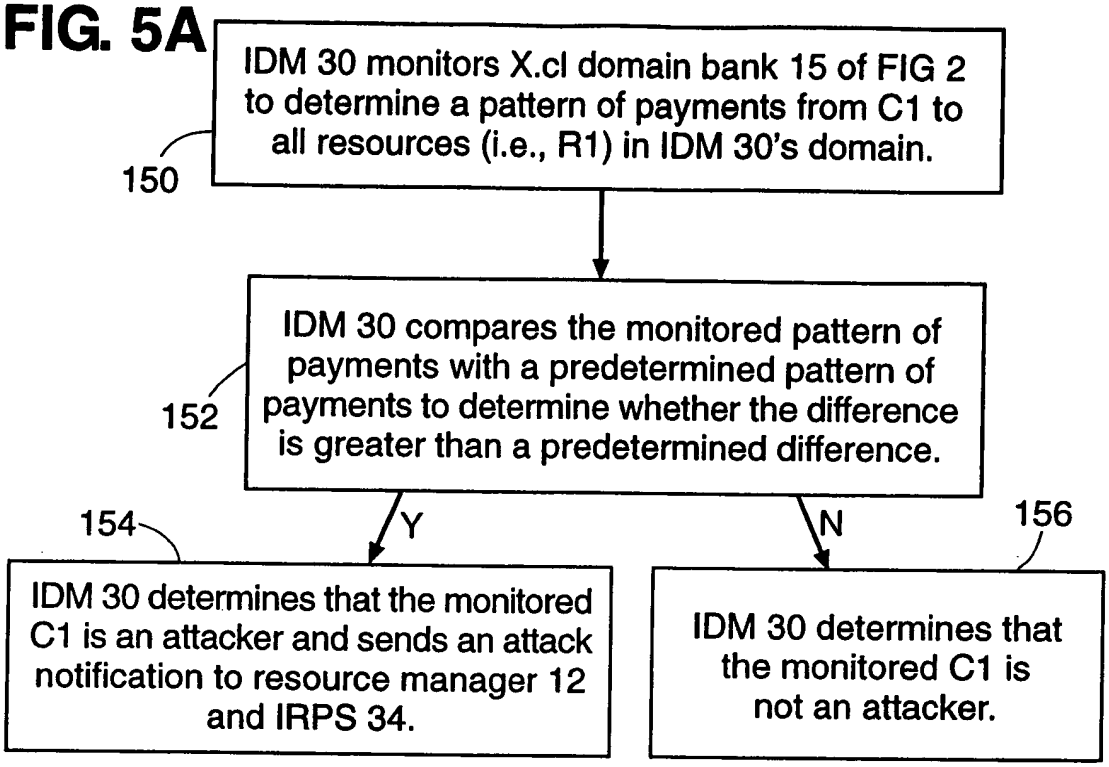

IDM 30 monitors X.cl domain bank 15 of FIG 2 to determine a pattern of payments from C1 to all resources (i.e., R1) in IDM 30's domain.
150
IDM 30 compares the monitored pattern of payments with a predetermined pattern of payments to determine whether the difference is greater than a predetermined difference.
152
Y
N
154
156
IDM 30 determines that the monitored C1 is an attacker and sends an attack notification to resource manager 12 and IRPS 34.
IDM 30 determines that the monitored C1 is not an attacker.

FIG. 5B

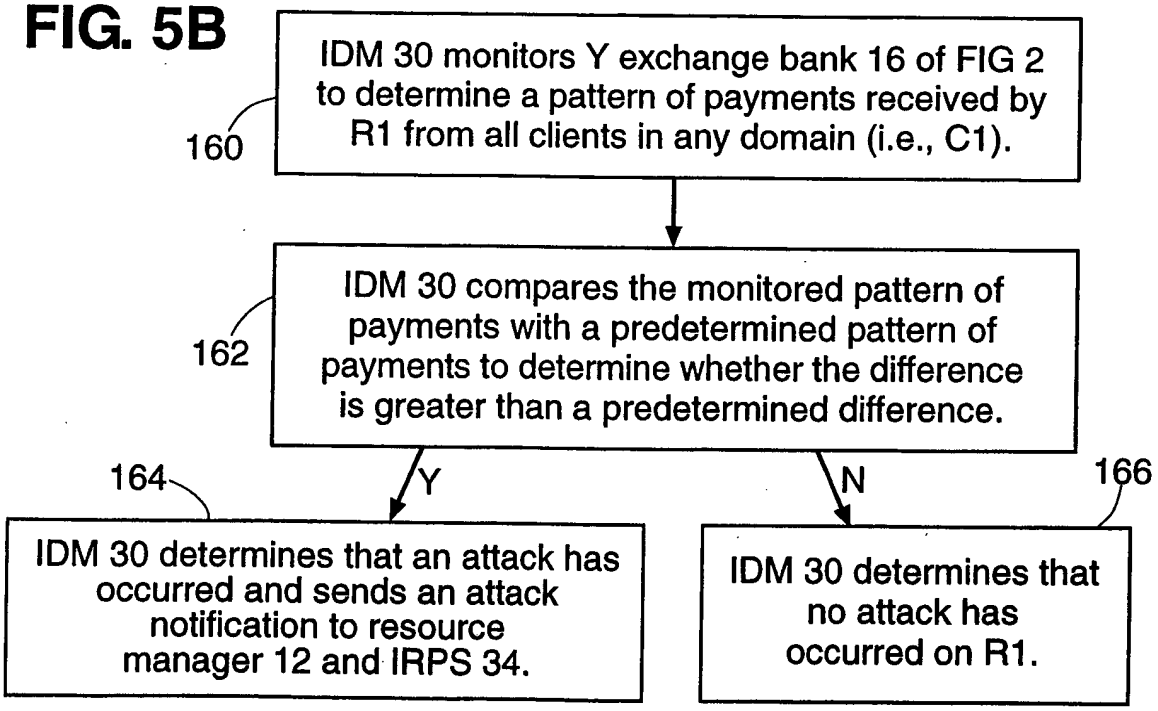

IDM 30 monitors Y exchange bank 16 of FIG 2 to determine a pattern of payments received by R1 from all clients in any domain (i.e., C1).
160
IDM 30 compares the monitored pattern of payments with a predetermined pattern of payments to determine whether the difference is greater than a predetermined difference.
162
Y
N
164
166
IDM 30 determines that an attack has occurred and sends an attack notification to resource manager 12 and IRPS 34.
IDM 30 determines that no attack has occurred on R1.

FIG. 7

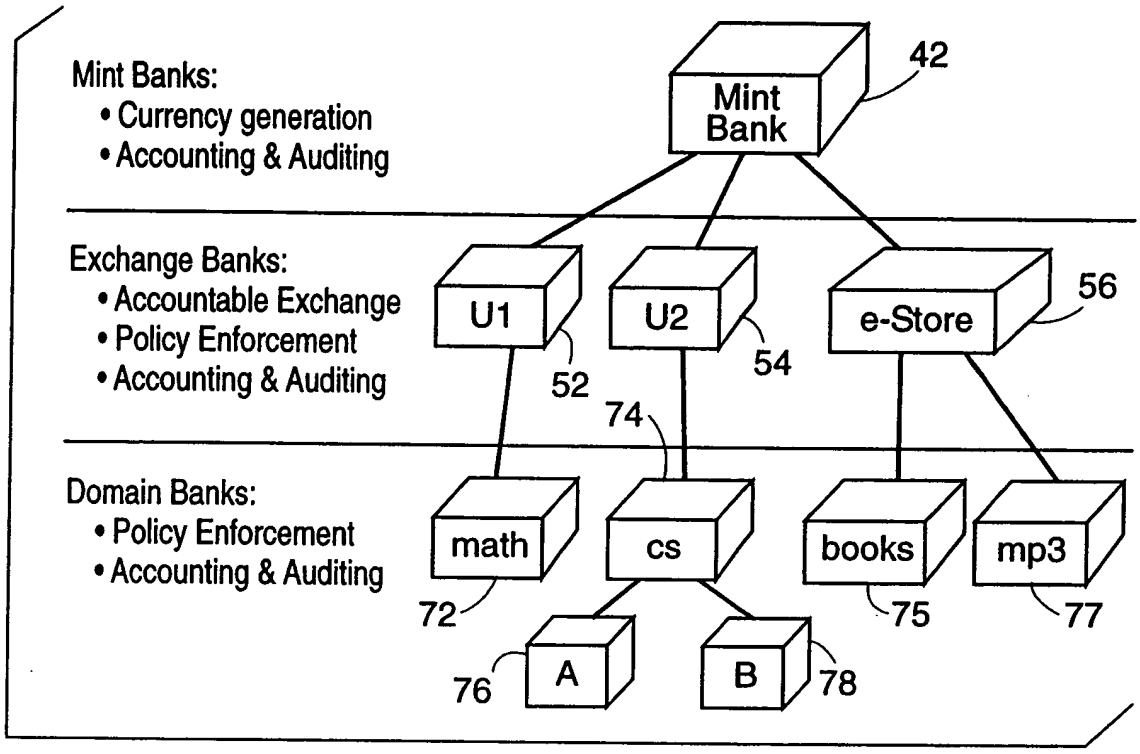

Mint Banks:
• Currency generation
• Accounting & Auditing
Mint Bank
42
Exchange Banks:
• Accountable Exchange
• Policy Enforcement
• Accounting & Auditing
U1
U2
e-Store
56
52
54
74
Domain Banks:
• Policy Enforcement
• Accounting & Auditing
math
cs
books
mp3
72
75
77
76
A
B
78

FIG. 10

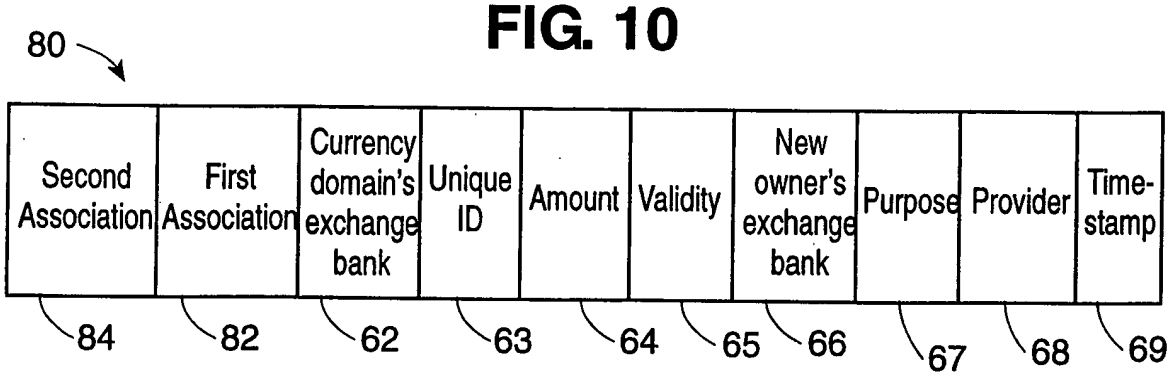

80
Second Association
First Association
Currency domain's exchange bank
Unique ID
Amount
Validity
New owner's exchange bank
Purpose
Provider
Time-stamp
84
82
62
63
64
65
66
67
68
69

FIG. 8A

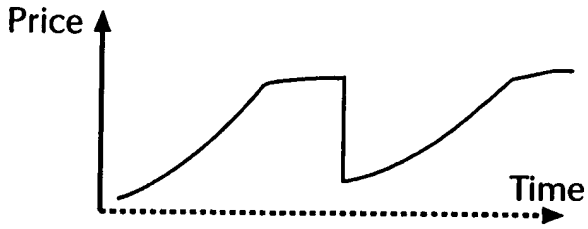


FIG. 8B

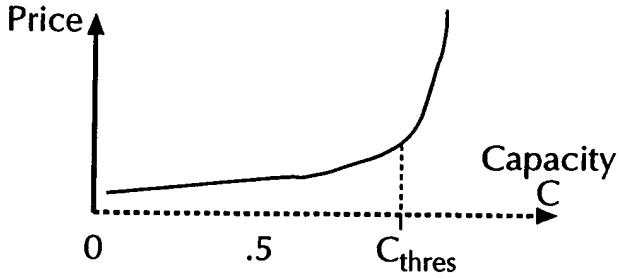


FIG. 9

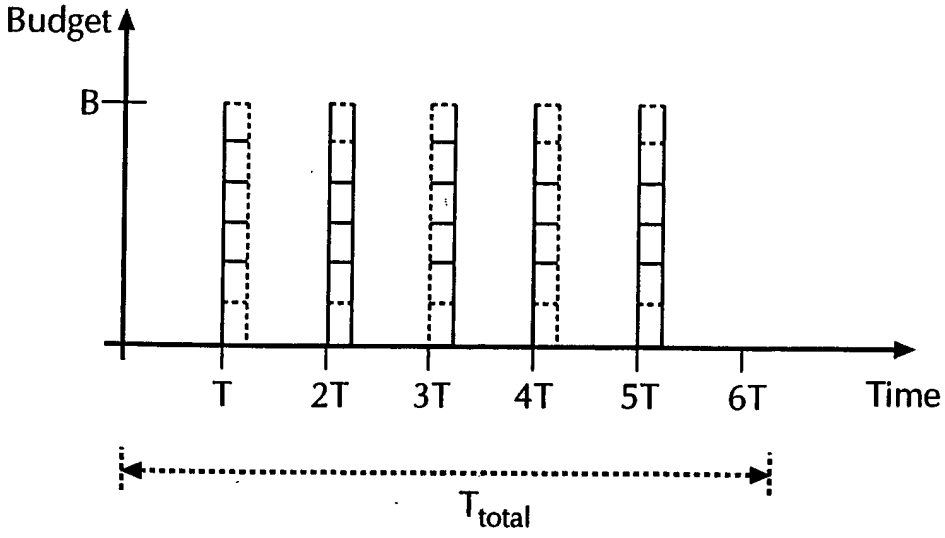


FIG. 11

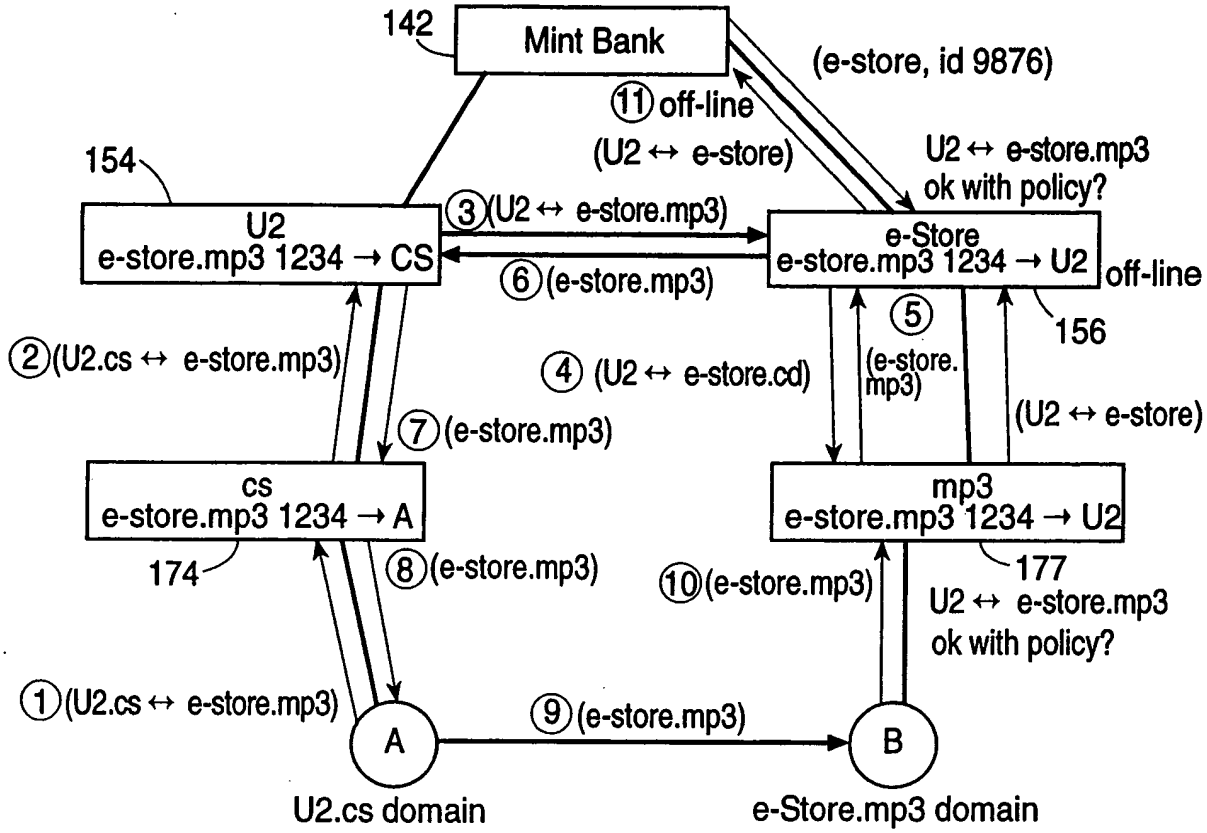

142
Mint Bank
(e-store, id 9876)
⑪ off-line
(U2 ↔ e-store)
U2 ↔ e-store.mp3
ok with policy?
154
U2
e-store.mp3 1234 → CS
③(U2 ↔ e-store.mp3)
e-Store
e-store.mp3 1234 → U2
off-line
⑥(e-store.mp3)
⑤
156
②(U2.cs ↔ e-store.mp3)
④ (U2 ↔ e-store.cd)
(e-store.
mp3)
(U2 ↔ e-store)
⑦(e-store.mp3)
cs
e-store.mp3 1234 → A
mp3
e-store.mp3 1234 → U2
174
⑧(e-store.mp3)
⑩(e-store.mp3)
177
U2 ↔ e-store.mp3
ok with policy?
①(U2.cs ↔ e-store.mp3)
A
⑨(e-store.mp3)
B
U2.cs domain
e-Store.mp3 domain

FIG. 12

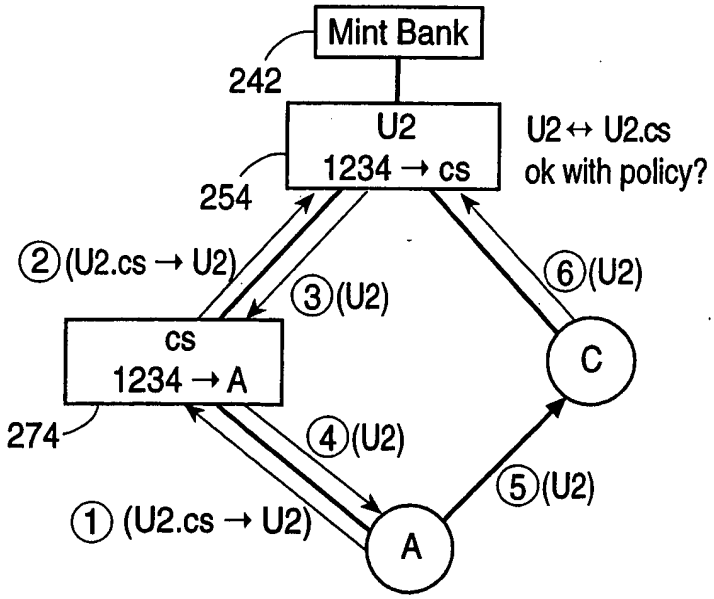

Mint Bank
242
U2
1234 → cs
U2 ↔ U2.cs
ok with policy?
254
②(U2.cs → U2)
③(U2)
⑥(U2)
cs
1234 → A
C
274
④(U2)
⑤(U2)
① (U2.cs → U2)
A

FIG. 13

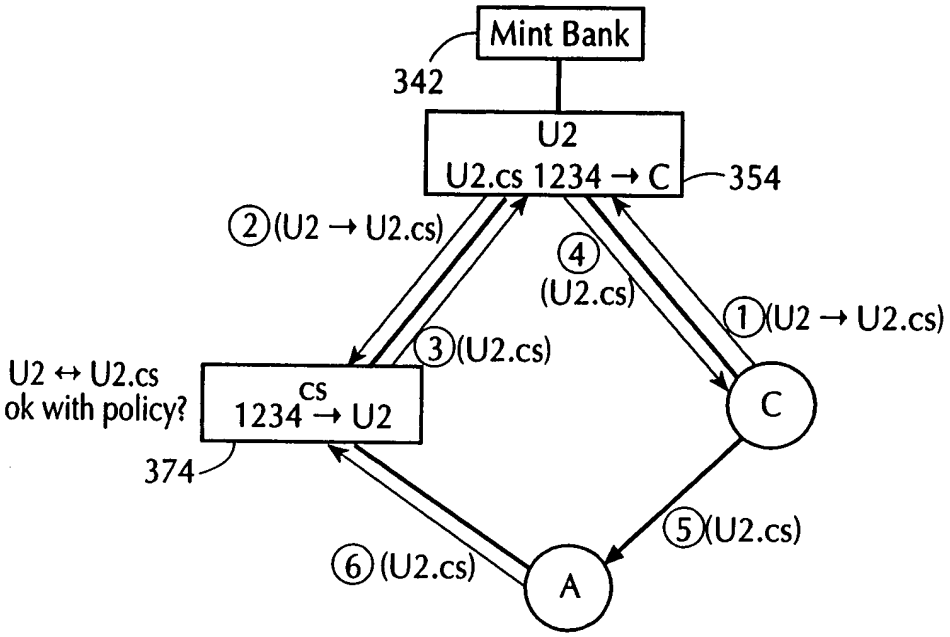

Mint Bank
342
U2
U2.cs 1234 → C
354
②(U2 → U2.cs)
④
(U2.cs)
①(U2 → U2.cs)
③(U2.cs)
U2 ↔ U2.cs
ok with policy?
cs
1234 → U2
374
C
⑤(U2.cs)
⑥(U2.cs)
A

FIG. 14

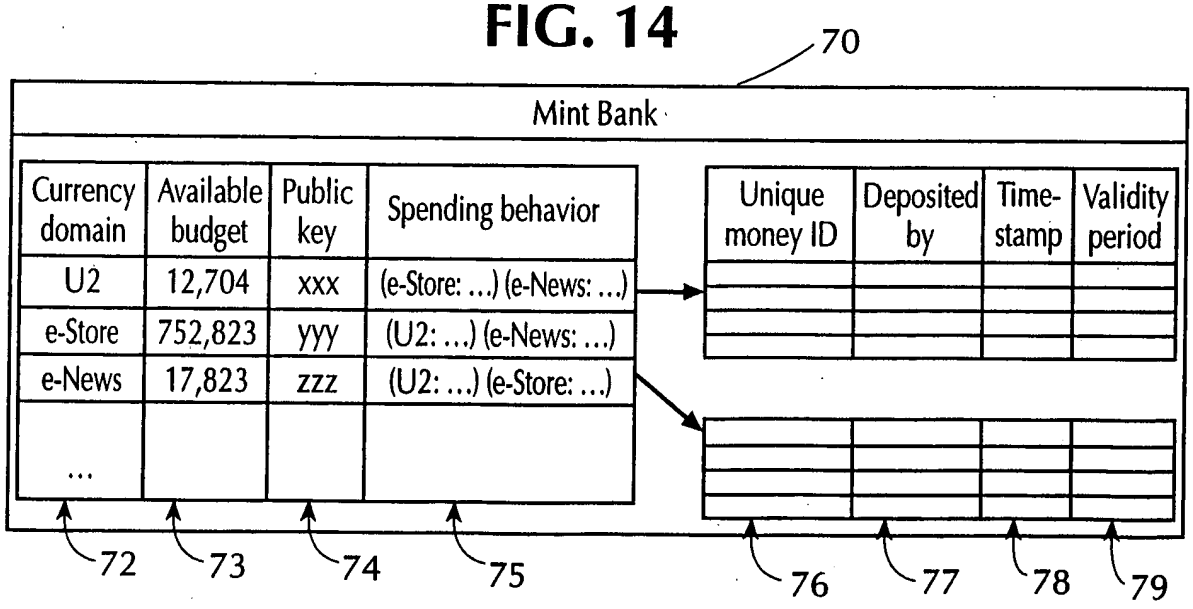
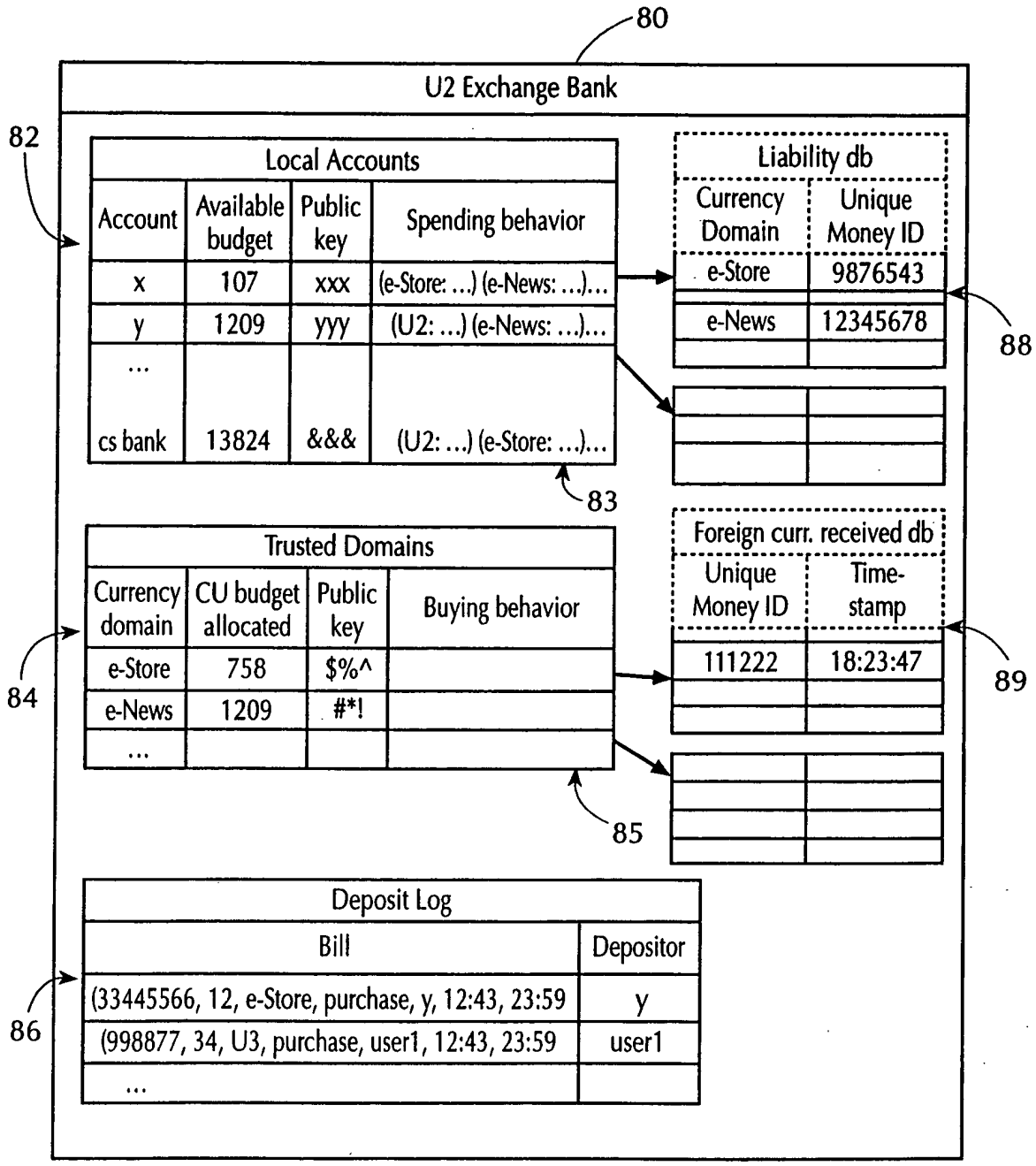

70
Mint Bank
Currency domain
Available budget
Public key
Spending behavior
U2
12,704
xxx
(e-Store: ...) (e-News: ...)
e-Store
752,823
yyy
(U2: ...) (e-News: ...)
e-News
17,823
zzz
(U2: ...) (e-Store: ...)
...
Unique money ID
Deposited by
Time-stamp
Validity period
72
73
74
75
76
77
78
79

FIG. 15


80
U2 Exchange Bank
82
Local Accounts
Account
Available budget
Public key
Spending behavior
x
107
xxx
(e-Store: ...) (e-News: ...)...
y
1209
yyy
(U2: ...) (e-News: ...)...
...
cs bank
13824
&&&
(U2: ...) (e-Store: ...)...
83
Liability db
Currency Domain
Unique Money ID
e-Store
9876543
e-News
12345678
88
Trusted Domains
Currency domain
CU budget allocated
Public key
Buying behavior
e-Store
758
$%^
e-News
1209
#*!
...
84
85
Foreign curr. received db
Unique Money ID
Time-stamp
111222
18:23:47
89
Deposit Log
Bill
Depositor
(33445566, 12, e-Store, purchase, y, 12:43, 23:59
y
(998877, 34, U3, purchase, user1, 12:43, 23:59
user1
...
86